

02 APR 19 AM 9:53

<110> Hahn, Beatrice  
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Shaw, George

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SEQ 13

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SEQ 14

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SEQ 17

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SEQ 22

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SEQ 24

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SEQ 25

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SEQ 27

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SEQ 28



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<210> 12

<211> 1479

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=gag

<400> 12

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ccaggtcaga	taagggaacc	taggggaagt	gatatagctg	gaactactag	tacccttcag	720
gaacaaatac	aatggatgac	aggcaacca	cctgtcccag	tgggagaaat	gtataaaaga	780
tggatcatcc	taggattaaa	taaaatagta	agaatgtata	gccctgtcgg	cattttggac	840

SEQ 34

f

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ataagacaag ggccaaaaga accctttaga gactatgtag acaggttctt taaaacccta 900
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<210> 13

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=vif

<400> 13

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agacatcact ttgaaagcag gcatccaaaa ataagttcag aagtacacat cccactagag 180
acagctgaat tagtaataac aacatactgg gggctgcttc caggagaaag agaatggcat 240
ctgggtcagg gagtctccat agaatggagg caggggaggt atagaacaca aatagaccct 300
ggcctggcag accaactgat ccatatatat tattttgatt gtttttcaga atctgccata 360
aggaaagcca tattaggaca taaaattagc cctaggtgta actatcaagc aggacataac 420
aaggtaggat ctctacaata cttggcacta acagcattaa tagctccaaa aaagacaaaag 480
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agggggccaca gagagagcca tacaatgaat ggacactag 579

```

<210> 14

<211> 291

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=vpr

<400> 14

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atggaaacaag cccagaaga ccaggggcca cagagagagc catacaatga atggacacta 60
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agcttaggac aacatatcta taacacctat ggggatactt gggaaggagt tgaagcaatc 180
ataaggatat tgcaacaact actgtttatc catttcagaa ttgggtgccg tcatagcaga 240
ataggcatta ctgcacagag aagagtaaga aatggaacta gtatgccta a 291

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<210> 15

<211> 2610

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=tat

SEQ 35

f

<400> 15

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ccttgtagca gatgttattg taaatgggtg tgctttcatt gttactgggtg ctttacaacg 120
aagggttagt gcatctccta tggcaggaag aagcggagac agcgaccaag aactcctcaa 180
agcagtcaga tacatcaaga ttttgtacca aagcagtaag tattgttaag catatgtaat 240
gtcaaatttg ttagcaatag gcatagcagc attaatagta gcactaataa taacaatagt 300
tgtgtggact atagcatata tagaatataa gaaactggta aggcaaagaa aaataaatag 360
gttatataaa agaataagcg aaagagcaga agacagtggc aatgagagtg aggggggatgc 420
agaggaattg gcagcacttg ggggaagtggg gcctttttatt cctgggggaca ttaataatct 480
gtaatgctgc agaaaactta tgggttacag tctattatgg ggtacctgtg tggaaagaag 540
caaccactac tctattctgt gcatcagatg ctaaatacata tgaaaaagag gcacataatg 600
tctgggctac acatgcttgt gtacccacag atcccaatcc acaagaagta gttctggaaa 660
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<210> 16

<211> 2661

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=rev

SEQ 36

f

<400> 16

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ggcatagcag cattaatagt agcactaata ataacaatag ttgtgtggac tatagcatat 180
atagaatata agaaactggg aaggcaaaga aaaataaata ggttatataa aagaataagc 240
gaaagagcag aagacagtggt caatgagagt gagggggatg cagaggaatt ggcagcactt 300
ggggaagtgg ggcccttttat tcctggggac attaataatc tgtaatgctg cagaaaactt 360
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tgcacagat gctaaatcat atgaaaaaga ggcacataat gtctgggcta cacatgcttg 480
tgtaccaca gatcccaatc cacaagaagt agttctggaa aatgtaacag aaaggtttaa 540
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gggtcaggaa ctaaagaata g 2661
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<210> 17

<211> 246

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

SEQ 37

f

<223> isolate=93BR020; gene=vpu

<400> 17

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gttgtgtgga ctatagcata tatagaatat aagaaactgg taaggcaaag aaaaataaat 120
aggttatata aaagaataag cgaaagagca gaagacagtg gcaatgagag tgagggggat 180
gcagaggaat tggcagcact tggggaagtg gggcctttta ttcctgggga cattaataat 240
ctgtaa                                           246
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<210> 18

<211> 2541

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=env

<400> 18

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gtacctgtgt ggaaagaagc aaccactact ctattctgtg catcagatgc taaatcatat 180
gaaaaagagg cacataatgt ctgggctaca catgcttgtg taccacaga tccaatcca 240
caagaagtag ttctgaaaaa tgtaacagaa aggtttaata tgtgggaaaa taacatggta 300
gaacaaatgc atacagatat aatcagttta tgggatcaaa gcctaaagcc atgtgtgaag 360
ttaacccac tctgtgttac tttagattgt agaaacattg ccaccaatgg caccaatgac 420
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gatatagtac aaatcaacaa ggatgacaat agaacatata gactaataaa ttgtgatgcc 600
tcaaccatta cacaggcttg tccaaaggta tcttgggatc caattcccat acattattgt 660
gctccagctg gttatgcat tctaaagtgt aatgagaaaa atttcacagg gacagggtca 720
tgcaagaatg tcagtacagt acaatgtaca catggaatta aaccagtggg atccactcaa 780
ttgttgtaa atggcagcct agcagaagga gagatagtaa tcagatctca aaatatctca 840
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SEQ 38

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gaaggaatcg aagaaggagg tggagagcaa ggcaaagaca gatccgtgag attagtgacc 2220
ggattcttag ctcttgccctg ggacgacctg cggaacctgt gcctcttcag ctaccgccac 2280
ttgagagact tcatattaat tgcagcgagg attgtggaca gggggctgaa gagggggtgg 2340
gaagctctca aatatctggg gaatctcaca cagtattggg gtcaggaact aaagaatagt 2400
gctattagct tgcttaatgc cacagcaata gcagtagctg agtggacaga tagagttata 2460
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ttggaaaggg ctttgctata a                                     2541

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<210> 19

<211> 27

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=nef

<400> 19

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27

<210> 20

<211> 8

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=gag-pol fusion

<400> 20

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8

<210> 21

<211> 207

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=gag

<400> 21

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ctggggagat ttgacttaa ccgtgacctt ttagaaacag cagaagggtg tgtgcaaata 180
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<210> 22

<211> 2739

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=pol; note=NH2-terminus  
uncertain

<400> 22

SEQ 39

f

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<210> 23

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=vif

SEQ 40

f

<400> 23

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agacatcact atgaaagcag gcatccaaga gtaagttcag aagtacacat cccactaaga 180
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ccacctttgc caagtgttgg gaaattagca gaagatagat ggaacaagcc ccagaagacc 540
agggaccaca gagagaacct tacaatgaat ggacattag 579
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<210> 24

<211> 291

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=vpr

<400> 24

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ggcttaggac agtatatcta taacacttat ggggatactt gggaaggagt tgaagccata 180
ataagaatac tacaacaact actgtttatc catttcagaa tcgggtgcca acatagcaga 240
ataggcatta ctccacagag aagagtaagg gatggaccg gtagacccta a 291
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<210> 25

<211> 2597

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=tat

<400> 25

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taggctaata cattgtaatg tctcaaccat taaacaggct tgtccaaagg taaattttga 1020
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SEQ 41

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cccaattccc atacattatt gtgctccagc tggttttgcg attttaaagt gtagggataa 1080
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taagccagtg gtatcaactc aactactgct gaatggcagt ttagcagaag aagatataag 1200
aattagatct gaaaatttca cagacaatac caaagtcata atagtgcagc ttaataatag 1260
tatagaaatt aattgtatca gacccaataa caatacaaga aaaagtatac caatcggacc 1320
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acatagtttc aattgtagag gagagttttt ctattgcaat acatcaggac tgtttaataa 1560
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ccagcgggaa cccgacaggc tcggaaaaac cgaagaagga ggtggcgagc aagacagaga 2580
cagatccact cgattag                                     2597

```

<210> 26

<211> 2663

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=rev

<400> 26

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tctgactaat agtagcattc atagcagcca caattgtgtg gagtatagta tttatagaat 180
atagaaaaat aagaaaacag aaaaaaatag aaaagttact tgatagaata agagaaagag 240
cagaagacag tggaaatgag agtgaagggg atacagagga attggcaaca cttatggaaa 300
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tgtgtccag ctggttttgc gatttttaag tgtagggata aggagtacaa tggaacagga 960
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SEQ 42

f

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acaggtgata taataggaga cataagacaa gcacattgta atgttagtag aataaaatgg 1260
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tggggtcggg aactaaagaa tag 2663

```

<210> 27

<211> 26

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=vpu (defective); note=10 bp  
deletion early in vpu frameshifts, results in  
premature termination

<400> 27

tgacggcctt agaaatatct gactaa

26

<210> 28

<211> 2550

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=env

<400> 28

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SEQ 43

f

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agttctgaaa aacataatgt ctgggctaca catgcctgtg taccacacaga ccctaaccca 240
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gaacagatgc aggaggatat aatcagttta tgggaggaaa gcctaaagcc atgtgtaaag 360
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<210> 29

<211> 1503

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=gag; CDS:  
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<400> 29

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ctggaaagat ttgcacttaa ccccgccctt ttagaaacac cagaaggctg tctacagata 180

```

SEQ 44

f

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taa
1503

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<210> 30

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=vif

<400> 30

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ccacctttgc ctagtgttag aaagctagta gaggatagat ggaacaagcc ccagaagacc 540
agggggccaca gagggagcca cacaatgaat ggacactag
579

```

<210> 31

<211> 291

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=vpr

<400> 31

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SEQ 45

f

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gagcttttag aggagattaa gaatgaggct gttaggcatt ttcctagagt atggctccat 120
caattaggac agcatatcta taacacctat ggagatactt gggtaggagt tgaagcttta 180
ataagaacgc tgcaacaact actgtttatt catttcagaa ttgggtgcc aatagcaga 240
ataggaatta ctcgacagag aagagtaaga aatggaccca gtagatccta a 291

```

<210> 32

<211> 624

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=nef

<400> 32

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atgggggggca agtgggtcaaa aagtagcata gttggatggc ctcagataag ggaaagaata 60
agacaaactc ctgtagcagc agaaggagta ggagcagtat ctcaagattt agctaggcat 120
ggagcaatca caagcagcaa tacagcaacc aacaatcctg attgtgcctg gctggaagca 180
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ctaatttact ccaagagaag acaagacatc cttgatctat gggctctataa tacacaagga 360
ttcttcccag attggcagaa ctacacacca gggccaggga ctagactccc actgaccttt 420
gggtggtgct tcaaaactagt accaatggac ccagcagaga tagaggaagc caataaggga 480
gagaacatca gtctattaca ccccatctgc cagcatggaa tggaggatga agacagagaa 540
gtgctggtat ggagatttaa cagtagccta gcacggagac acctagcccg agagctgcat 600
ccggagtact acaaagactg ctga 624

```

<210> 33

<211> 2606

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=tat; CDS: join (5177..5391,  
7698..7782)

<400> 33

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aaaggcttag gaatttccta tggcaggaag aagcggagcc agcgacacag aactcctgca 180
agtttgcaag atcatcaaaa ttctatatca aagcagtaag tattatcata aatgtatata 240
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tccaagctta tggagatggg gcaccttaat cttgggtatg ttgctgatct gtagtgctgc 480
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catacattat tgtgctccag ctggctttgc gattctaaag tgtaacaata aaacattcaa 1080

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SEQ 46

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aacagactgg	aataagactt	tacaccaggt	agttacacaa	ttaggaatac	acttgaacaa	1440
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taattgtaga	ggagaatttt	tctattgcaa	tacatcaggg	ctgtttaata	gtagtggga	1560
aatgcatact	aattacacat	caaattgacac	aaagggaaac	gaaaacatta	cactgccatg	1620
cagaataaaa	caaattgtaa	acatgtggca	gagagtagga	cgagcaatgt	atgccctcc	1680
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ttggagaagt	gaattgtata	aatataaagt	agtaaaaatt	gaaccactgg	gaatagcacc	1860
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ttttgctgtg	ctttctatag	taaatagagt	taggcaggga	tactcacctt	tgtcttttca	2520
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<210> 34

<211> 2657

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=rev; CDS: join(5316..5391,  
7698..7972)

<400> 34

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cgctagtagt	aacattttatc	atagccgtaa	ttgtgtggac	catagtatat	atagaatata	180
aaaaattggt	aaggcaaaag	aaaatagaca	ggctaattga	aagaatagga	gaaagagcag	240
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gtatattatg	gggtacctgt	gtggaaagag	gcaaaaacca	ctctattctg	tgcatcagat	420
gctaaggcat	atgagacaga	aaagcataat	gtctgggcta	cacatgcatg	tgtaccaca	480
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gctggctttg	cgattctaaa	gtgtaacaat	aaaacattca	atggaacagg	attatgtaca	960
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SEQ 47

f

```

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caggaactaa agaatag 2657

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<210> 35

<211> 243

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=vpu

<400> 35

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gtgtggacca tagtatatat agaataaaa aaattggtaa ggcaaaagaa aatagacagg 120
ctaattgaaa gaataggaga aagagcagaa gacagtggca acgagagtga tggagacaca 180
gaggaattat ccaagcttat ggagatgggg caccctaatac ttgggtatgt tgctgatctg 240
tag 243

```

<210> 36

<211> 2538

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=env

<400> 36

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atggagacac agaggaatta tccaagctta tggagatggg gcaccttaat cttgggtatg 60

```

SEQ 48

f

```

ttgctgatct gtagtgctgc acaaaacttg tgggttacag tatattatgg ggtacctgtg 120
tgaaaagagg caaaaaccac tctattctgt gcacacagatg ctaaggcata tgagacagaa 180
aagcataatg tctgggctac acatgcatgt gtacccacag accccaaccc acaagagatg 240
gtcatggaga atgtaacaga gagctttaat atgtgggaaa ataacatggt ggagcagatg 300
catacagaca taatcagttt atgggatcaa agcttgaaac catgtgtaaa attaaccca 360
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gaaagaagct tgctataa 2538

```

<210> 37

<211> 621

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=nef

<400> 37

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aggcgagctg aaccagtagc agaaggggta ggagcagtg ctcgagattt ggatagacgc 120

```

SEQ 49

f

```

ggggcagtca caattaataa tacagcatct actaatcgtg atgccgcctg gctggaagca 180
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tacttcctg actggcagaa ctacacacca gggccagggg agagatttcc cctgaccttt 420
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gagaacaaca gcttgctaca ccccatgagc ctgcatggaa tggaggatga cgggagagaa 540
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ccggagtaca aagactgctg a

```

<210> 38

<211> 1486

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=gag

<400> 38

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gctggaaaga tttgcactta accctgacct tttagagaca ccagaaggct gtaaacaaat 180
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```

<210> 39

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=vif

<400> 39

f

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agacatcatt atgaaagcag acatccaaaa ataagttcag aagtacacat cccattaggg 180
gaagctagat tagtaataaa aacatattgg ggtttgcaaa caggggaaag agattggcat 240
ttgggtcatg gagtctccat agaattggaga ttgagaagat ataagacaca agtagaccct 300
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aaggtaggat ctctacaata cttggcactg acagcattga taaaaccaa aaagataaag 480
ccacctctgc ctagtgttag taaattagta gaggataaat ggaacaagcc ccagaagacc 540
aggggccgca gaggggaacca tacaatgaat ggacactag 579

```

<210> 40

<211> 291

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=vpr

<400> 40

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gacttaggac aatatatcta tgaaacctat ggggatactt ggaggggagt agaagctata 180
ataagaattc tgcaacaact actgtttatc catttcagaa ttgggtgccg gcatagcaga 240
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```

<210> 41

<211> 2640

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=tat

<400> 41

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aaaggcttag gcatttecta tggcaggaag aagcggagac agcgacgaaa cgctcctcca 180
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gtccaaaggt atcctttgag ccaattccca taaattattg tgcccagct ggtttcgcga 1080
ttctaaagtg taaagataaa aagttcaatg gaacagggcc atgcaagaat gtcagcacag 1140

```

SEQ 51

F

tacaatgcac	acatggaatc	aagccagtag	tatcaactca	gctgctgtta	aatggcagtc	1200
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tagtacaact	taacgagact	gtacaaatta	attgttccag	acctaacaac	aatacaagaa	1320
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<210> 42

<211> 2658

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=rev

<400> 42

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tatgcaatag	tagcactgat	agtggcgcta	atcatagtga	tagttgtgtg	gacttttagca	180
ggtatagaat	ataagaaatt	gctaaagcaa	aggaaaatag	atagggttaat	taagaaaata	240
agagaaagag	cagaagatag	tggcaatgag	agtgatgggg	acattgatga	attatcaaaa	300
cttgtggggg	tggggaacta	tgatcttggg	gatgttaaca	atttgtagtg	ctgcaaacaa	360
cttgtgggtt	actgtctact	atgggggtacc	tgtgtggaaa	gacgcagaga	ccaccttatt	420
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catcaccaat	gtcaacaaca	ctgtcaacat	tacggatgac	atgaaaggag	aaataaaaaa	720
ctgctctttc	aatatgacca	cagaatttaag	ggataagaaa	cagagagtgt	attcactttt	780
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caagccagta	gtatcaactc	agctgctgtt	aaatggcagt	ctagcagaag	aagagataat	1080
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SEQ 52

f

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attgattgca	gcgaggacgg	tggaacttct	gggacgcagc	agtctcaggg	gactacagag	2640
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<210> 43

<211> 246

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=vpu

<400> 43

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aggtaatta	agaaaataag	agaaagagca	gaagatagt	gcaatgagag	tgatggggac	180
attgatgaat	tatcaaaact	tgtgggggtg	gggaactatg	atcttgggga	tgtaacaat	240
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<210> 44

<211> 2583

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=env

<400> 44

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ttggggatgt	taacaatttg	tagtgctgca	aacaacttgt	gggttactgt	ctactatggg	120
gtacctgtgt	ggaaagacgc	agagaccacc	ttattttgtg	catcagatgc	taaagcatat	180

SEQ 53

f

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gatccagaaa agcataatgt ctgggctaca catgcctgtg tacccataga ccccgaccca 240
caagaaatac atttggaaaa tgtgacagaa gagtttaaca tgtggaaaaa taacatggta 300
gagcagatgc atacagatat aatcagtcta tgggaccaaa gcctaaagcc atgtgtaaag 360
ttaacccttc tctgcgttac tttagagtgt aacaacatca ccaatgtcaa caacactgtc 420
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ttaagggata agaaacagag agtgtattca cttttttata ggcttgatat agtacaaatt 540
aatagcaata gtaataacag tagtcataat cagtataagg taataaattg taatacctca 600
gccattacac aggcttgtcc aaaggatatcc tttgagccaa ttcccataaa ttattgtgcc 660
ccagctgggt tgcgcatctt aaagtgtaaa gataaaaagt tcaatggaac agggccatgc 720
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2583

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<210> 45

<211> 624

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=nef

<400> 45

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```

SEQ 54

f

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tacttccctg attggcaaaa ctacacacca ggaccagggg tcagatatcc actgactttt 420
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gaggacaact gcttactaca ccctctgagc cagcatggaa tggaggatga ggacagagaa 540
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ccggagtatt ataaagactg ctga

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<210> 46

<211> 8

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; standard name=3' LTR repeat  
region; note=3' R repeat should end one base  
beyond end of this

<400> 46

aaaaaaaa

8

<210> 47

<211> 1494

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG003; gene=gag

<400> 47

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ccacaagatt tgaataccat gctaaacacc gtgggggggc atcaagcagc tatgcaaatg 600
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SEQ 55

f

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<210> 48  
<211> 4307  
<212> DNA  
<213> Human immunodeficiency virus type 1

<220>  
<223> isolate=92NG003; gene=gag-pol fusion

<400> 48  
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ctggagagat ttgcacttaa ccttgacctc ttagaaacaa cagaaggttg tcagcaaata 180  
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SEQ 56

f

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tttgaaagg	accagcaaaa	ctactctgga	aagggtgaagg	ggcagtagta	atacaggaca	4200
atagtgcgat	aaaggtagta	ccaagaagaa	aagtaaaaat	cattaaggat	tatggaaaac	4260
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<210> 49

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG003; gene=vif

<400> 49

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agacatcact	atgaaagtag	gcatccaaaa	gtaagttcag	aagtacacat	cccactaggg	180
gaggctagat	tagtagtaag	aacatatttg	ggtctgcata	caggagaaaag	agactggcac	240
ttgggtcagg	gggtctccat	agaatggaag	cagagaagat	atagcacaca	aatagatcct	300
gacctagcag	accaactgat	tcacctgcat	tatttttaact	gtttttcaga	atcggccgta	360
aggaaagcca	tactaggaga	agtagttaga	cctaggtgtg	aatatcaaac	aggacataat	420
caggtaggat	cactacaata	tttagcactc	aaagcattag	taacaccaac	acagacaaaag	480
ccacctttac	ctagtgttaa	gaagttaaca	gaagatagat	ggaacgagcc	ccagaagacc	540
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<210> 50

<211> 114

<212> DNA

SEQ 57

f

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG003; gene=vpr

<400> 50

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gaactgttag aagaacttaa acatgaagct gttagacatg gcttcattgga ttag      114
```

<210> 51

<211> 2579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG003; gene=tat

<400> 51

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atggagctgg tagatcctag cctagagccc tggaaccacc caggaagtca gcctacaact 60
gcttgtaaca aatgttactg taaaatatgc tgctggcatt gccattgtg ctttctgaac 120
aagggcctag gcatctccta tggcaggaag aagcggagac gccgacgagg aactcctcag 180
agtcaccagg atcatcaaaa tccgtgacca aagcagttag tagtaatagt tagtatatgt 240
gatgcaatcc ttgaaatatg ctgcaatagc aggactagta gtagcagcca tagcagccat 300
agttgtgtgg accatagaaa aataaagaaa caggagaaaa tagacagggt acttgataga 360
ataagagaaa gagcagaaga tagtggcaat gagagtgaag gggacacaga ggaattggca 420
acacttgtgg acatggtgga ctttgatcct tgggttggtg ataatttgta gtgcctcaaa 480
taacttgtgg gtcacagtct attatggggt accagtgtgg gaagacgcag ataccctctc 540
atthttgtgca tctgatgcta aagcatatag tactgaaaga cataatgtct gggccacaca 600
tgctgtgtga cccacagacc ccaaccaca agagataact ctggaaaatg taacagaaac 660
ttttaacatg tggaaaaata acatggtaga acagatgcat gaggatataa tcagtttatg 720
ggatgaaagc ctaaagccat gtgtaaagct aaccctctc tgtgttacct taaactgtac 780
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gcaacagcaa agcaatttgc tgagggctat agaggcgag caacatctat tgcaactcac 2040
agtctggggc attaaacagc tccaggcaag agtcctggct gtagaaagat acctaaagga 2100
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SEQ 58

f

ttggaacact	agttggagta	ataaatctta	tgaggagatt	tgggataaca	tgacctggat	2220
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gcagaaccag	caggaaaaga	atgaacaaga	cttattggca	ttggacaagt	gggcaagttt	2340
gtggaactgg	tttgacataa	caaaatggct	atgggtatata	aaaatattta	taatgatagt	2400
aggaggttta	ataggtttaa	gaatagtttt	tgctgtgctt	tctatagtaa	atagagttag	2460
gcagggatac	tcacctttgt	cattccagac	ccttaccac	caccagaggg	aaccgcagac	2520
gcccgaaga	atcgaagaag	gaggtggaga	gcaagacaga	gacagatcag	tcgcgttag	2579

<210> 52

<211> 2645

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG003; gene=rev

<400> 52

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gctgcaatag	caggactagt	agtagcagcc	atagcagcca	tagttgtgtg	gaccatagaa	180
aaataaagaa	acaggagaaa	atagacaggt	tacttgatag	aataagagaa	agagcagaag	240
atagtggcaa	tgagagtga	ggggacacag	aggaattggc	aacacttgtg	gacatggtgg	300
actttgatcc	ttgggttggg	gataatttgt	agtgccctca	ataacttgtg	ggtcacagtc	360
tattatgggg	taccagtgtg	ggaagacgca	gataccctc	tattttgtgc	atctgatgct	420
aaagcatata	gtactgaaag	acataatgtc	tggggccacac	atgcctgtgt	acccacagac	480
cccaaccac	aagagataac	tctggaaaat	gtaacagaaa	cttttaacat	gtggaaaaat	540
aacatggtag	aacagatgca	tgaggatata	atcagtttat	gggatgaaag	cctaaagcca	600
tgtgtaaagc	taaccctct	ctgtgttacc	ttaaactgta	ctaagtcaa	ttgtaacagt	660
aatgtgacca	gcactgggaa	cagtgtctgg	accaacgcta	cgtgtaacat	agaagaagca	720
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gaatatgcgc	ttttctatag	acttgatgtg	gtaccaatcg	atggtaataa	taatgtctca	840
aataactata	ggctaataaa	ttgtaatgtc	tcaaccatta	aacaagcttg	tccaaaggtg	900
tcttttgacc	cacttcccat	acattattgt	gctccagctg	ggtttgcat	tttaaagtgt	960
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gaaatagtaa	ttagatctga	aaacctcaca	gacaatgcca	aagtcataat	agtacagctt	1140
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aataaatctt	atgaggagat	ttgggataac	atgacctgga	tacaatggga	aaggggaagtc	2100
agcaattaca	cacaacaaat	atacagccta	attgaagaat	cgcagaacca	gcaggaaaag	2160
aatgaacaag	acttattggc	attggacaag	tgggcaagtt	tgtggaactg	gtttgacata	2220

SEQ 59

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acaaaatggc tatggtatat aaaaatatat ataatgatag taggagggtt aatagggtta 2280
agaatagttt ttgctgtgct ttctatagta aatagagtta ggcaggata ctcacctttg 2340
tcattccaga cccttaccce ccaccagagg gaacccgaca ggcccgaag aatcgaagaa 2400
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aatag                                           2645

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<210> 53

<211> 230

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG003; gene=vpu

<400> 53

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gttgtgtgga ccatagaaaa ataaagaaac aggagaaaat agacaggtta cttgatagaa 120
taagagaag agcagaagat agtggcaatg agagtgaagg ggacacagag gaattggcaa 180
cacttgtgga catggtggac tttgatcctt gggttggtga taattttag 230

```

<210> 54

<211> 2538

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG003; gene=env

<400> 54

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atgagagtga aggggacaca gaggaattgg caacacttgt ggacatggtg gactttgatc 60
cttgggttgg tgataatttg tagtgcctca aataacttgt gggtcacagt ctattatggg 120
gtaccagtgt ggggaagacgc agataccctt ctattttgtg catctgatgc taaagcatat 180
agtactgaaa gacataatgt ctgggccaca catgcctgtg taccacaga ccccaacca 240
caagagataa ctctggaaaa tgtaacagaa acttttaaca tgtggaaaaa taacatggta 300
gaacagatgc atgaggatat aatcagttta tgggatgaaa gcctaaagcc atgtgtaaag 360
ctaaccctc tctgtgttac cttaaactgt actaatgtca attgtaacag taatgtgacc 420
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aggctaataa attgtaatgt ctcaaccatt aaacaagctt gtccaaaggt gtcttttgac 660
ccacttccca tacattattg tgctccagct gggtttgcca ttttaaagtg taggggtaag 720
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aaaccagtgg tatcaactca attactacta aatggtagtc tagcagaagg agaaatagta 840
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aagataaaac aaattgtgag aatgtggcag agagtgggac aagcaatgta tgccctccc 1260
atcgcaggag atattacatg tagatcaaac attacagggc tattattaac aagagatggg 1320

```

SEQ 60

f

```

gggggttaata atactggaaa tgagaccttc agacctggag gaggagatat gagggacaat 1380
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accaaggcaa ggagaagagt ggtggagaga ggaaaaaggg cagttggact gggagctgtc 1500
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acacaacaaa tatacagcct aattgaagaa tcgcagaacc agcaggaaaa gaatgaacaa 1920
gacttatttg cattggacaa gtgggcaagt ttgtggaact ggtttgacat aacaaaatgg 1980
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gaaagagctt tgctataa 2538

```

```

<210> 55
<211> 621
<212> DNA
<213> Human immunodeficiency virus type 1

```

```

<220>
<223> isolate=92NG003; gene=nef

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<400> 55
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gcaatcacia gcagcaatac agcacaactc aatcctgatt gtgcctggct agaagcacia 180
caggagaatt cagaggtagg ctttccagtc agacaacagg tacctttgag accaatgact 240
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ttcccagatt ggcagaacta cactccaggg ccagggacta gattccact gacatttcgg 420
tggtgcttca aactagtacc aatggatcca gcagagatag aggaagccaa taaaggagag 480
aacaacagtt tattacacc tatctgccaa catggcctgg aagatgcgga cagagaagtg 540
ctggtatgga gatttgacag tagcctagca cggagacaca tagcccgaga acaacatccg 600
gagtactata aggactgctg a 621

```

```

<210> 56
<211> 1438
<212> DNA
<213> Human immunodeficiency virus type 1

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<220>
<223> isolate=93BR029; gene=gag


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```

<400> 56
atgggtgcga gagcgtcagt aataagcggg ggagaattag ataatggga aaaaattagg 60
ttaaggccag gaggacataa aaaatataga ttaaaacata tagtatgggc aagcagggga 120

```

SEQ 61



gctagaacga	ttcgcagtta	atcctggcct	tttagagaca	tcagaaggct	gtagacaaat	180
actggaacag	ctacaaccag	cccttaagac	gggatcagaa	gaacttagat	cattatataa	240
tacagtagca	accctctatt	gtgtacatca	aaagatagat	gtaaaagaca	ccaaggaagc	300
tttagaaaag	atagaggaag	agcaaaaaca	agtaagaaaa	aggcacagca	agcagcagct	360
aacacaggaa	acaacagcca	ggtcagccaa	aattacccta	tagtgcagaa	ccttcagggg	420
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ttaaaagaaa	ccatcaatga	ggaagctgca	gaatggggaca	gagtacatcc	agtgcattgca	660
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cacaagggaa	ggccagggaa	tttccttcag	agcagaccag	agccaacagc	cccaccagca	1380
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<210> 57

<211> 3012

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=pol; note=NH2-terminus  
uncertain

<400> 57

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ctctcagaaa	caggagccga	tagacaagga	gatgtatcct	ttggcttccc	tcagatcact	180
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gataccggag	cagatgatac	agtattagaa	gaaataaatt	taccaggaag	atggaaacca	300
aaaatgatag	ggggaattgg	aggtttttatc	aaagtaagac	agtatgatca	aatacccata	360
gaaattttgt	gacgtaaagc	tacaggtaca	gtattagtag	gacctacacc	tgtcaacata	420
attggaagaa	atctgttgac	tcagattggc	tgcactttaa	attttcccat	tagtcctatt	480
gaaactgtac	cagtaaaatt	gaagccagga	atggatggcc	caaggggttaa	acaatggcca	540
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aaaatttcaa	aaattgggcc	cgaaaatcca	tacaatactc	cagtatttgc	cataaagaaa	660
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gacttctggg	aagttcagtt	agggatacca	catcccgcag	ggttaaagaa	gaaaaaatca	780
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ccattccttt	ggatgggtta	tgaactccat	cctgataaat	ggacagtaca	gcctatagtg	1200
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SEQ 62

f

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tataaaaatt	tgaaaacagg	aaagtatgca	aggatgaggg	gtgcccacac	taatgatgta	1560
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gaaggggcag	tagtaataca	agataatagt	gacataaaaag	tagtgccaag	aagaaaagta	2940
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<210> 58

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=vif

<400> 58

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agacatcact	ttgaaagcag	gcatccaaga	gtaagttcag	aagtacatat	cccactagag	180
gaagctaaat	tagtaataac	aacatatttg	gggctgcata	caggagaaaag	agattggcat	240
ctgggtcagg	gagtcctccat	agaatggagg	caggggaggt	ataggacaca	aatagaccct	300
ggcctggcag	accaactgat	ccatatatat	tatttttgatt	gtttttcaga	atctgccata	360
aggaaagcca	tattaggaca	tagaattagc	cctaggtgtg	attatcaagc	aggacataac	420
aaggtaggat	ctctacagta	cttggcacta	acagcattaa	taaaaccaa	aaagagaaaag	480
ccacctttgc	ccagtgttaa	gaaactgaca	gaggatagat	ggaacaagcc	ccagaagacc	540
aaggaccaca	gagggagcca	tacaatgaat	ggacactag			579

<210> 59

<211> 291

<212> DNA

SEQ 63

f

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=vpr

<400> 59

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gaacttttag aggaacttaa gagtgaagct gttagacatt ttcctagggt atggctccat 120
agcttaggac aacatatcta tgaaacttat ggggatactt gggcaggagt ggaagccata 180
ataagaattc tgcaacaact gctgtttatt catttcagaa ttggatgtca acatagcaga 240
ataggcatta atcgacagag gagagcaagg aatggagcca gtagatccta g                291
```

<210> 60

<211> 2601

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=tat

<400> 60

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gcttgtaata gttgctattg taaaaagtgt tgctttcatt gtcaagtttg tttcacaaca 120
aagggttag gcatctccta tggcaggaag aagcggagac agcgacacag aactcctcaa 180
agcagtcagc tacatcaaga tcctgtacca aagcagtaag tattgttaag taatatatgt 240
aatgtcatat ttgttagtaa taggttttagc agcatataa gcagcactaa taatagcaat 300
agttgtgtgg actatagcat atatagaata tagggaaacta gtaaggcaaa gaaaaataaa 360
taggttatat aaaagaataa gagaaagagc agaagacagt ggcaatgaga gtgaggggga 420
tgcagaggaa ttggcagcac ttggggaaat ggggcctttt attcctgggg atattgataa 480
tctgtaatgc tgaaaacttg tgggtcacag tctattatgg ggtacctgtg tggaaagaag 540
caaccactac tttattctgt gcatcagatg ctaaagcata tgaaaaagaa gcacataatg 600
tctgggctac acatgcctgt gtaccacag atcccaatcc acaagaagta gttctggaaa 660
atgtaacaga aaattttgat atgtggaaaa ataacatggg agaacaaatg catacagata 720
taatcagttt atgggatcaa agcctgaagc catgtgtgaa gttaacccca ctctgtgtta 780
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agaataatca gacggaggag accttcagac ctggggggagg aaatatgaaa gacaactgga 1800
gaagtgaatt atataaatat aaagtagtag aaattgagcc attaggagta gcaccacca 1860
aggcaaaaag acaagtgggtg aagagagaaa aaagagcagt gggaatggga gctttgttcc 1920
ttgggttctt gggagcagca ggaagcacta tgggcgcagc gtcaataacg ctgacggcac 1980
```

SEQ 64

```

aggccagaca attattgtct ggcatagtgc aacagcagaa taatttgctg agggctattg 2040
aagcgcaaca gcatctgttg cagctcacag tctggggcat taaacagctc caggcaagaa 2100
tcctggctgt ggaaagatac ctaaaggatc aacagctcct agggcttttg ggctgctctg 2160
gaaaactcat ctgcaccact gatgtgccct ggaactctag ttggagtaac aaatctcagg 2220
agaagatctg ggggaacatg acctggatgg agtgggaaaa agagattagc aattactcaa 2280
acgaaatata taggttaatt gaagagtcgc agaaccagca ggaaaagaat gaacaagaat 2340
tattggcatt ggacaaatgg gcaagtctgt ggaattgggt tgacatatca aaatggctgt 2400
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ctgtgctttc tatagtaa atagtttagga agggatactc acctttgtca ttacagacct 2520
gcttcccaag cccaaggga cccgacaggg ccgaaggaat cgaagaagga ggtggagagc 2580
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2601

<210> 61

<211> 2652

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=rev

<400> 61

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ataggttttag cagcattaat agcagcacta ataatagcaa tagttgtgtg gactatagca 180
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cttggggaaa tggggccttt tattcctggg gatattgata atctgtaatg ctgaaaactt 360
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tgcacatgat gctaaagcat atgaaaaaga agcacataat gtctgggcta cacatgcctg 480
tgtaccacac gatcccaatc cacaagaagt agttctggaa aatgtaacag aaaattttga 540
tatgtggaaa aataacatgg tagaacaat gcatacagat ataatcagtt tatgggatca 600
aagcctgaag ccatgtgtga agttaacccc actctgtgtt actttacgtt gtagtaatgc 660
cactaccaac agtactcaaa acgacacct gaaggaagag ccaggggcaa taaaaactg 720
ttctttcaat atgaccacag aagtaagaga taagcagctg aaagtacatg cactttttta 780
taggcttgat atagtaccaa tcagcaatga taatagtagc aatgataata gtagcagaga 840
atacaggcta ataaattgta atacctcaac ccttacacag gcttgtccaa aggtatcctg 900
ggatccaatt cccatacatt attgtgctcc agctgggtat gcgattctaa agtgtaatga 960
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atctgtgccg attaattgta caagacccaa caacaatata agaaaaagta taccaatagg 1200
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tgacacagta gacaatggca ctatcactct cccatgtcga ataaagcaaa ttgtaaatat 1500
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gaagagagaa aaaagagcag tgggaatggg agctttgttc cttgggttct tgggagcagc 1800
aggaagcact atgggcgag cgtcaataac gctgacggca caggccagac aattattgtc 1860
tggcatagt caacagcaga ataatttgct gagggctatt gaagcgcaac agcatctgtt 1920
gcagctcaca gtctggggca ttaaacagct ccaggcaaga atcctggctg tggaaagata 1980

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SEQ 65

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cctaaaggat caacagctcc tagggctttg gggctgctct ggaaaactca tctgcaccac 2040
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gaagaggggg tgggaagccc tcaaacttct ggggaatctc gcgctgtatt ggagtcagga 2640
actaaagaat ag                                     2652

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<210> 62

<211> 2529

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=env

<400> 62

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cctgtgtgga aagaagcaac cactacttta ttctgtgcat cagatgctaa agcatatgaa 180
aaagaagcac ataatgtctg ggctacacat gcctgtgtac ccacagatcc caatccacaa 240
gaagtagttc tggaaaatgt aacagaaaat tttgatatgt ggaaaaataa catggtagaa 300
caaatgcata cagatataat cagtttatgg gatcaaagcc tgaagccatg tgtgaagta 360
acccccactct gtgttacttt acgtttagt aatgccacta ccaacagtac tcaaacgac 420
accctgaagg aagagccagg ggcaatacaa aactgttctt tcaatatgac cacagaagta 480
agagataagc agctgaaagt acatgcactt ttttataggc ttgatatagt accaatcagc 540
aatgataata gtagcaatga taatagtgc agagaataca ggctaataaa ttgtaatacc 600
tcaaccctta cacaggcttg tccaaaggta tcttgggatc caattcccat acattattgt 660
gtccagctg ggtatgcat tctaaagtgt aatgataaaa aattcaatgg gacggggcca 720
tgcaggaatg tcagcacagt acaatgtaca catggaatta aaccagtggg atcaactcaa 780
ttgttggtta atggcagcct agcagaaaaa gatataataa tcagatctca aaatatctca 840
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cccaacaaca atacaagaaa aagtatacca ataggaccag gacgagcatt ttatacaaca 960
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agtaacaaat ctcaggagaa gatctggggg aacatgacct ggatggagtg ggaaaaagag 1860
attagcaatt actcaaacga aatatatagg ttaattgaag agtcgcagaa ccagcaggaa 1920

```

SEQ 66

f

```

aagaatgaac aagaattatt ggcattggac aaatgggcaa gtctgtggaa ttggtttgac 1980
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<210> 63

<211> 621

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=nef

<400> 63

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ggggcaatta caagcagcaa tactggagct aataatcctg acttggcctg gctggaggca 180
caagaggaag aggaagtagg ctttccagtc agacctcagg tacctttaag accaatgact 240
tataagggag ctcttgatct cagtcacttt ttaaaagaaa agggggggact ggaaggggta 300
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tggtgcttca agctagtacc agttgaccca gagggagtag aaaaggccaa tgaaggagag 480
aacaactgct tgctacaccc catgagccaa catggaatgg aggatgaaga cagagaaata 540
ctgcagtgga ggtttgacag ccgcctagca tttcatcaca tggcccagaga gctgcatccg 600
gagtactaca aggactgctg a                                     621

```

<210> 64

<211> 1503

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY032.3; gene=gag

<400> 64

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ttaaagata ccatcaatga ggaagctgca gactgggaca ggacacatcc agtacatgca 660
gggcctattc caccaggcca gatgagagaa ccaaggggaa gtgatatagc aggaactact 720

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SEQ 67

f

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ctgctgggtc	aaaatgcgaa	tccagactgt	aagtccatct	taaaagcatt	aggaacaggg	1020
gctacattag	aagaaatgat	gacagcatgt	cagggagtgg	gaggaccag	ccataaagca	1080
agagttttag	ctgaggcaat	gagccaggca	tcaaattgcag	cagcagccat	aatgatgcag	1140
aaaagcaaat	ttaagggcca	aagaagaact	attaagtgtt	tcaactgtgg	caaggaagga	1200
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gcggaatgct	tagagaggaa	agaggagaca	acctctctc	tgaagcagga	accgagggac	1440
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taa						1503

<210> 65

<211> 3009

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CT032.3; gene=pol

<400> 65

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tctgaagcag	gaaccgaggg	acaaggaact	atatccttta	acttccctca	aatcactctt	180
tggcagcgac	cccttgtcac	aataaaacta	gggggacaga	taagggaggc	tcttttagat	240
acaggagcag	atgatacagt	attagaagaa	ataaatttgc	caggaaaatg	gaagccaaaa	300
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atttgtggaa	aaaaggccat	aggcacagtg	ttagtaggac	ctacacctgt	caacataatt	420
ggacgaaaca	tgttgactca	gcttgggtgt	actttaaatt	ttccaattag	tcctattgaa	480
actgtaccag	taaaaataaa	gccaggaatg	gatggcccaa	aggttaaaca	atggccattg	540
acagaagaaa	aaataaaaagc	cttaacagag	atatgtacag	acatggaaaa	ggaaggcaag	600
atttcaaaaa	ttgggcctga	aatccatac	aatactccaa	tatttgctat	aaagaaaaaa	660
gacagcacta	aatggagaaa	attagtagat	ttcagagaa	tcaataaaa	aactcaggac	720
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SEQ 68

f

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caggattcag gatcagaagt aaacatagta acagactcac agtatgcaat aggaatcatt 1980
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gaagattag                                     3009

```

<210> 66

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CT032.3; gene=vif

<400> 66

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agacatcact atgaaagtag gcacccaaaa gtaagttcag aagtacatat ccactaggg 180
gaggctagat tagtagtaag aacatattgg ggtctgcagc caggggaaca agactggcac 240
ttgggtcatg gagtctccat agaatggagg ctcaagaagat atagcacaca agtggatcct 300
gacctggcag accaactaat tcatatgcat tactttgatt gtttttcaga atctgccata 360
aggaaagcca tattaggaca tagagttagt cctagggtgtg aatatcaagc aggacataat 420
aaggtaggat cttacaata cctggcacta gcagcattaa tatcccaaaa aaagacaaaag 480
ccacctttgc ctagtgttaa gaaactagtg gaggatagat ggaacaagcc ccagaagacc 540
aggggccgca gagagaacca aataatgaat ggacactag                                     579

```

<210> 67

<211> 288

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY032.3; gene=vpr

<400> 67

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ggcctaggac agcatatcta taacacttat ggagatacct gggaaggggt tgaagctata 180

```

SEQ 69

f

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<210> 68

<211> 2643

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CT032.3; gene=tat

<400> 68

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gtacaataga ataagagaaa gagcagaaga cagtggcaat gagagtgatg gggatgcaga 420  
ggaattatcc acacttgttg gaatggggaa ctttgatcct tgggttggtg ataactgtga 480  
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SEQ 70

f

ggcagggata ctcacctttg tctttgcaga cccttatccc aacaacccaa cggggactcg 2580  
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<210> 69

<211> 2688

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CT032.3; gene=rev

<400> 69

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gaatataaga aattgagaag gcaaaggaga atagacagct tgtacaatag aataagagaa 240  
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ggaatgggga actttgatcc ttgggttggt gataatctgt agtgcctcaa acaacttggtg 360  
ggtcacagtt tattatgggg tacctgtgtg gagagacgca gagaccaccc tattttgtgc 420  
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aacaaaatgg ctatggtata taaaaatatt tataatgata gtaggaggct tgataggctt 2340  
aagaataatt tttgctgtgc tttctatagt aaatagagtt aggcagggat actcacctt 2400  
gtctttgcag acccttatcc caacaaccca acggggactc gacaggcccg gaggaacaga 2460

SEQ 71

f

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actcttaatt gtagcgagga ctgtggaact tctggggata aggggggtggg aagccctcaa 2640
gtatctgtgg aacttcctgc tgtattgggg acaggagcta aagaatag 2688

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<210> 70
<211> 246
<212> DNA
<213> Human immunodeficiency virus type 1

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<220>
<223> isolate=94CT032.3; gene=vpu

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<400> 70
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agcttgtaga atagaataag agaaagagca gaagacagtg gcaatgagag tgatggggat 180
gcagaggaat tatccacact tgtgggaatg gggaaactttg atccttgggt tgggtgataat 240
ctgtag 246

```

```

<210> 71
<211> 2571
<212> DNA
<213> Human immunodeficiency virus type 1

```

```

<220>
<223> isolate=94CY032.3; gene=env

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```

<400> 71
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gtacctgtgt ggagagacgc agagaccacc ctattttgtg catcagaagc taaagcatat 180
gagaaagaag tacataatat ctgggctaca catgcctgtg taccacaga cccaaccca 240
caagaagtag ctctgataaa tgtaacagag aactttaaca tgtggaaaaa tgacatggta 300
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agagtgccaa ttaatggtag taataggaat aatagtacag aagagtatat gttaataaat 600
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```

SEQ 72

f

```

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tgcaacatac ctagaagaat cagacagggc cttgaaagag ctttgcttta a 2571

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<210> 72  
 <211> 660  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> nef

```

<400> 72
atgggaggca aatggtcaaa aagtagcata gttggatggc ctgagataag ggaaagaatg 60
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ggagtaggag cagtgtctca agacttggaac aaacatgggg caatcacaat taacaataca 180
gcagctacta atcctgacaa aacctggctg gaagcacaag aagaggaaga agaggtaggt 240
tttccagtcg ggccacaggt acctttaagg ccaatgacct tttaaaggagc tttagatctc 300
agccactttt taaaagaaaa ggggggactg gatgggctaa tttactccaa gaaaagacaa 360
gagatccttg atctgtgggt ctatcacaca caaggtttct tccctgattg ggataactac 420
acaccaggac caggggagag attccactg tgctttggat ggtgcttcaa gctagtacca 480
gtagatccac aggaggtgga agaggccact gaaggagaga acacctgttt gctgcacct 540
ataagccagc atggaatgga ggatgaagag agagaagtat taaagtggaa gtttgacagt 600
cgcttgcat acaagcacgt agcccagag ctgcatccgg agttttacaa agactgctga 660

```

<210> 73  
 <211> 1485  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=96ZM651.8; gene=gag

```

<400> 73
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ctaaggccag ggggaaagaa acgctatatg ataaaacacc tagtatgggc aagcaggag 120
ctggaaagat ttgcgcttaa ccctggcctt ttgaaacat cagaaggctg taaacaaata 180
atgaaacagc tacaaccagc tcttcagaca ggaacggagg aacttagatc attatacaac 240
acagtagcaa ctctctattg tgtacatgaa ggggtagagg tacgagacac caaggaagcc 300

```

SEQ 73

f

ttagacagga	tagaggaaga	acaaaacaaa	attcagcaaa	aaatacagca	aaaaacacag	360
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atggtacacc	agaaactatc	acctagaact	ttgaatgcat	gggtaaaagt	aatagaagaa	480
aaagcttttta	gccagaggt	aatacccatg	tttacagcat	tatcagaagg	agccacccca	540
caagatttta	acaccatggt	aaatacagtg	gggggacatc	aagcagccat	gcaaagtgtta	600
aaagatacta	tcaatgagga	ggctgcagaa	tgggatagat	tacatccagt	gcatgcaggg	660
cctattgcac	caggccaaat	gagagaacca	aggggaagtg	atatagcagg	aactactagt	720
accctccaag	aacagatagc	atggatgaca	agtaatcccc	ctattccagt	gggagacatc	780
tataaaagat	ggataattct	gggggttaaat	aaaatagtaa	gaatgtatag	ccctgtcagc	840
attttggaca	taaaacaagg	gccaaaggaa	ccctttagag	actatgtaga	ccggttcttc	900
aaaactttta	gagctgaaca	ggctacacaa	gaagtaaaaa	attggatgac	agacaccttg	960
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gtgttggctg	aggcaatgag	ccaaacaaat	agtgtaaaca	tactgatgca	gaaaagcaat	1140
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agaaattgca	gggcccttag	gaaaaagggc	tgttggaaat	gtggaaagga	gggacaccaa	1260
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ttcaggttcg	aggagacaac	ccccgctccg	aagcaggagt	cgaagacag	ggaagcctta	1440
acttcctca	aatcactctt	tggcagcgac	cccttgtctc	aataa		1485

<210> 74

<211> 3000

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96ZM651.8; gene=pol

<400> 74

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gaagcaggag	tcgaaagaca	gggaagcctt	aacttccctc	aaatcactct	ttggcagcga	180
ccccttgtct	caataaaggt	agggggccaa	ataaaggagg	ctctcttaga	cacgggagca	240
ggtgatacag	tattagaaga	aataaatttg	ccaggcaaat	ggaaaccaa	aatgatagga	300
ggaattggag	gctttatcga	agtaagacaa	ttgatcaaaa	tacctatgga	aatttgtgga	360
aaaaaggcta	taggtacagt	attagtagga	cctacacctg	tcaacataat	tggaaagaa	420
atgttgactc	agcttggatg	cacactaaat	tttccaatta	gtcctattga	aactgtacca	480
gtaaaattaa	agccaggaat	ggatggccca	aagggttaaac	aatggccatt	gacagaagag	540
aaaataaaaag	ctttaacagc	aatttgtgaa	gaaatggaga	aggaaggaaa	aattacaaaa	600
attgggcctg	aaaatccata	taacactcca	gtatttgcca	taaaaaagaa	ggacagtact	660
aagtggcgaa	aattagtaga	tttcagggaa	ctcaataaaa	gaactcaaga	cttttgggaa	720
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gatgtggggg	atgcatatct	ttcagttcct	ttagatgaaa	gcttcaggaa	atatactgca	840
ttcaccatac	ctagtacaaa	caatgaaaca	ccagggatta	gatatcaata	taatgtgctt	900
ccacagggat	ggaaaggatc	accagcaata	ttccagagta	gcatgacaaa	aatcttagag	960
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gatagctgga	ctgttaatga	tatacagaag	ttagtgggaa	aattaaactg	ggcaagtcag	1260
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acagacatag	taccactaac	tgaagaagca	gaattagaat	tggcagagaa	caaggaaatt	1380
ttaaaagaac	cagtacatgg	ggtatattat	gacccatcaa	aagacttgat	agctgaaata	1440

SEQ 74

f

```

cagaaacaag ggcattgacca atggacatat caaattttacc aggaaccatt caaaaatctg 1500
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ccagataaga gtgaatcaga gttagtcaac caaataatag aacaattaat aaagaaggaa 2040
agggctctacc tgtcatgggt accagcacat aaaggaattg gaggtaatga acaggtagat 2100
aaattagtaa gcaagggaat caggaaagtg ctgtttctag atggaataga caaggctcaa 2160
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gtaatacaag ataatagtga cataaaagtg gtaccaagga ggaaagcaaa aatcattagg 2940
gactatggaa aacagatggc aggcgctgat tgtgtggcag gtagacagga tgaggattag 3000

```

<210> 75

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96ZM651.8; gene=vif

<400> 75

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atggaaaaca gatggcaggc gctgattgtg tggcaggtag acaggatgag gattagaaca 60
tggaatagtt tagtaaagca ccatatgtat atttcacgga aagctaattg atggttttac 120
agacatcatt atgaaagcag acatccaagg gtaagttcag aagtacatat cccattaggg 180
gatgctaaat tagtaataaa aacatattgg ggtttgcaaa caggagaaaag agattggcat 240
ttgggtcatg gagtctccat agaattggaga ttgagaagat atagcacaca agtagaccct 300
ggcctggcag accagctaata tcatatgcac tattttgatt gttttgcaga ctctgccata 360
agaaaagcca tattaggaca catagtattt cctaggtgtg actatcaagc aggacataat 420
aaggtaggat ctctgcaata cttggcactg acagcattga taaaacaaa aaagagaaaag 480
ccacctctgc ctagtgttag gaaattagta gaggatagat ggaacaattc ccagaagacc 540
aagggccgca gagggaacca tacagtgagt ggacactag 579

```

<210> 76

<211> 291

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96ZM651.8; gene=vpr

SEQ 75

f

<400> 76

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gagattctag aggaactcaa gcaggaagct gtcagacact ttcctagacc atgggtccat 120
agcttaggac aacatatcta tgaaacttat ggggatactt ggactggagt cgaggctata 180
ataagaatac tgcaacaact actgtttatt catttcagaa ttgggtgcca gcacagcaga 240
atagggcatgg ttcgacagag aagagcgaga aatggagcca gtagatccta g 291
```

<210> 77

<211> 2666

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96ZM651.8; gene=tat

<400> 77

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gcttgaataa agtggtattg caaacgctgt agctatcatt gtctagtttg ctttcagaca 120
aaaggccttag gcatttcata tggcaggaag aagcggagac agcgacgcag cactcctcct 180
agcagcgagg accatcaaga tcctatatca aagcagtaag tatatgtaat gttagattta 240
ctagcaagag taaattatag agtaggagta ggagcattga tagtagcact actcatagca 300
atagttgtgt ggaccatagc atatatagaa tataggaagc tgttaagaca aagaaaaata 360
gactggttaa ttaaaagaat tagggaaaga gcagaagaca gtggcaatga gagtgagggg 420
gatactgagg aattggcaac gatggtggac atggggcatc ttaggctttt ggatgttaat 480
gatttgaat gtgtggggga acttgtgggt cacagtctat tatgggggtac ctgtgtggaa 540
agaagcaaaa actactctat tctgtgcac agatgctaaa tcatatgaga aagaagtgca 600
taatgtctgg gctacacatg cctgtgtacc cacagacccc aaccacaag aaatagtttt 660
gggaaatgta acagaaaatt ttaacatgtg gaaaaatgac atggtggatc agatgcatga 720
ggatataatc agtttatggg atcaaaagcct aaagccatgt gtaaagttga cccactctg 780
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aattgtgtgt gtaagaccca acaataatac aagacaaagt ataagaatag gaccaggaca 1380
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gagtgaattg tataagtata aagtggtaga aattaaggca ttgggaatag caccactga 1920
ggcaaaaagg agagtgggtg agagagaaaa aagagcagtg ggaataggag ctgtgttct 1980
tggttcttg ggagcagcag gaagcactat gggcgagcg tcaataacgc tgacggcaca 2040
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```

SEQ 76

f

```

aaaactcatc tgcaccactg ctgtgccttg gaacatcagt tggagtaata aatctaaaac 2280
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cacaatatat aggttgcttg aggactcgca gagccagcag gagcaaaatg aaaaagattt 2400
attagcattg gacagttgga acaatctgtg gaattgggtt gacataacaa aatggctgtg 2460
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tgtactctct atagtgaata gagttaggca gggatactca cctttgtcgt ttcagaccct 2580
tatcccgaa ccaagggaac ccgacaggcc aggaagaatc gaagaagaag gtggagagca 2640
agacaaagag agatccgtgc gattag 2666

```

<210> 78

<211> 2684

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96ZM651.8; gene=rev

<400> 78

```

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gagtaggagt aggagcattg atagtagcac tactcatagc aatagtgttg tggaccatag 180
catatataga atataggaag ctgttaagac aaagaaaaat agactgggta attaaaagaa 240
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ttctgtgcat cagatgctaa atcatatgag aaagaagtgc ataagtcttg ggctacacat 480
gcctgtgtac ccacagaccc caaccacaa gaaatagttt tgggaaatgt aacagaaaat 540
ttaacatgt ggaaaaatga catgggtgat cagatgcatg aggatataat cagtttatgg 600
gatcaaagcc taaagccatg tgtaaagttg accccactct gtgtcacttt aaattgtaca 660
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aatagcatga atggagacat gaaaaattgc tctttcaaca taaccacaga actaaaagat 780
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```

SEQ 77

f

```

acctggatgc agtgggatag agaaattagt aattacacaa acacaatata caggttgctt 2220
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cgcagcagtc tcaagggact acagaggggg tgggaagccc ttaa 2684

```

<210> 79

<211> 261

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96ZM651.8; gene=vpu

<400> 79

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ctactcatag caatagttgt gtggaccata gcatatatag aatataggaa gctgttaaga 120
caaagaaaaa tagactgggt aattaaaaga attagggaaa gagcagaaga cagtggcaat 180
gagagtgagg gagatactga ggaattggca acgatgggtg acatggggca tcttaggctt 240
ttggatgtta atgatttgta a 261

```

<210> 80

<211> 2607

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96ZM651.8; gene=env

<400> 80

```

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ttttggatgt taatgatttg taatgtgtgg gggaacttgt gggtcacagt ctattatggg 120
gtacctgtgt ggaaagaagc aaaaactact ctattctgtg catcagatgc taaatcata 180
gagaaagaag tgcataatgt ctgggctaca catgcctgtg taccacaga ccccaacca 240
caagaaatag ttttgggaaa tgtaacagaa aattttaaca tgtggaaaaa tgacatggtg 300
gatcagatgc atgaggatat aatcagttta tgggatcaaa gcctaaagcc atgtgtaaag 360
ttgaccccac tctgtgtcac tttaaattgt acagagggtta atgttaccag aaatgttaat 420
aatagcgtgg ttaataatac cacaatgtt aataatagca tgaatggaga catgaaaaat 480
tgctctttca acataaccac agaactaaaa gataagaaaa agaattgtgta tgcactttt 540
tataaacttg atatagtatc acttaatgag actgacgact ctgagactgg caactctagt 600
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tcttttgacc caattcctat acattattgt gctccagctg gttatgcat tctaaagtgt 720
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catggaatta agccagtggg atcaactcaa ctactgttaa atggtagcct agcagaagaa 840
gggataataa ttagatctga aaatctgaca aacaatgtca aaacaataat agtacatctt 900
aatagatcta tagaaattgt gtgtgtaaga cccaacaata atacaagaca aagtataaga 960
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SEQ 78

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 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> nef

<400> 81		
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<210> 82  
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 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=96ZM751.3; gene=gag



<400> 82

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<210> 83

<211> 3017

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96AM751.3; gene=pol

<400> 83

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SEQ 80

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<210> 84

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96ZM751.3; gene=vif

<400> 84

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SEQ 81

<210> 85  
<211> 291  
<212> DNA  
<213> Human immunodeficiency virus type 1

<220>  
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<212> DNA  
<213> Human immunodeficiency virus type 1

<220>  
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SEQ 82

f

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<210> 87

<211> 2631

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

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<400> 87

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SEQ 83

f

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agcacttgctc tgggacgacc tccggagcct gtgccttttc agctaccacc gcttgagaga 2580
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<210> 88

<211> 261

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96AM751.3; gene=vpu

<400> 88

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caaagaaaaa tagaccgggtt aattaaaaga attagagaaa gggcagaaga cagtggcaat 180
gagagtgaag gggataatga ggaattggca acaatgggtg atatggggca tcttaggctt 240
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<210> 89

<211> 2544

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96AM751.3; gene=env

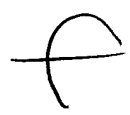
<400> 89

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aatataacca cagaattaag agataagagg aggcaggtag atgcactctt ttataaactt 540
gatatagtac caattaatga gaattccagt gaatatagat taataaattg taatacctcg 600
gccataacac aagcatgtcc aaagggttact tttgacccaa tccctataca ttattgtgct 660
ccagctgggt atgcgattct aaagtgtaac aataagacat tcaatggaac aggaccatgc 720
aataatgtca gcacagtaca atgtacacat ggaattaagc cagtagtatc aactcaatta 780
ctgttaaatt gtagtctagc agaagaagag ataataatta gatctaaaaa tatgacagac 840

```

SEQ 84



```

aatgccaaaa taataatagt acatcttaat gaatctgtag aaattgtgtg tacaagaccc 900
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tgccaggggg taggacaagc aatgtatgct cctccaatta aaggaaacat aacatgtaaa 1320
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agtgtctatta gtttgcttga tactatagca atagcagtag ctgaaggaac agatagaatt 2460
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ggctttgaag cagctttgca ataa 2544

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<210> 90

<211> 624

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96AM751.3; gene=nef

<400> 90

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ggggcactta caagcagtaa cacaagtacc aataatgctg attgtgcctg gctggaagcg 180
caagaggagg agggagaagt aggctttcca gtcagacctc aggtaccttt aagaccaatg 240
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ttaatttact gtaagaaaag acaagaaatc ctcgatttgt ggggtctatca cacacaaggc 360
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gaggacaact gtttgctaca ccctataagc cagcatggaa tagaagatga agacagagaa 540
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ccggagtatt acaagactg ctga 624

```

<210> 91

<211> 1491

<212> DNA

f

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=gag

<400> 91

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ctggagaaat tctcaattaa ccctggcctt ttagaaacac cagagggatg tagacaaata 180
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ctagataaaa tagaggaaga acaaaacaag cagaaaacac agcatgcagc agctgacaca 360
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caggctatat cacctaggac gttgaatgcc tgggtcaaag tagtagaaga aaaggctttc 480
agcccagaag taatacctat gtttacagca ttatcagaag gagccacccc acaagactta 540
aatactatgc taaacacagt ggggggacat caagcagcta tgcaaatgtt aaaagatacc 600
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ccaggccaga tgagagaacc aaggggaagt gacatagcag gaactactag tacccttcag 720
gaacaaatag gttggatgac cagcgatcca cccatcccag tgggagaaat ttataaaaga 780
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<210> 92

<211> 3012

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=pol

<400> 92

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cctgaagcag gaactggaga ccagggaacc atacaatcct gcaatttccc tcaaatcact 180
ctttggcaac gaccccttgt tacagtaaag atagagggac agctaaaaga agctctatta 240
gatacaggag cagatgatac agtgttagaa gaaataaatt tgccaggaaa atggaaacca 300
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gaaatttgtg gaaaaagggc cataggtaca gtattagtag gacctacccc tgtcaacata 420
atcggagaa atattgttgg ttagcttggg tgtactttaa attttccaat tagtcttatt 480
gaaactgtac cagtaaaatt aaagccagga atggatggtc caaagggtta acaatggcca 540
ttgacagaag aaaaaataaa agcattaaca gaaatctgta aagaaatgga aaaggaagga 600
aaaatttcaa aaattgggcc tgaaaatcca tacaacactc cagtgtttgc tataaagaaa 660
aaagacagca ctaaatggag aaaattagta gatttttagag aactcaataa gagaactcaa 720
gacttctggg aagttcagtt aggaatacca catccagcag gattaaaaaa gaaaaaagca 780
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SEQ 86

f

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tacaatgtac	ttccacaggg	atggaaagga	tcaccagcaa	tattccagag	tagcatgaca	960
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gaaggggcag	tagtaataca	agacaatagg	gcataaaagg	tagtaccaag	aagaaaagca	2940
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<210> 93

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=vif

<400> 93

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SEQ 87



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aaggtagggg ctctgcaata tttggcattg aaagcagtag tagcttcaac aaggacaaaag 480
ccacctttgc ctagtgttag gaaattagta gaggatagat ggaacaagcc ccagaagacc 540
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<210> 94

<211> 291

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=vpr

<400> 94

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<210> 95

<211> 2655

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=tat

<400> 95

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SEQ 88

f

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<210> 96

<211> 2721

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=rev

<400> 96

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aagcctaaag	ccatgtgtaa	aattaacccc	gctctgcgtc	atttttaaatt	gtagcaatgc	660
caataccagc	acccatagca	atagcagtag	caccagagc	cccattaatg	aagaaataaa	720
aaactgctct	tacaatacta	ccacaatact	aagagataag	acacaaaaag	tttatttact	780
gttttataga	cttgatgtag	tacaacttga	tgaaagtga	aataagaata	catcaggtag	840
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ggtaaccttt	gagccaattc	ctatacatta	ttgtgcccc	gctgggtttg	cgattctaaa	960
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attaagagag	aaattcccta	agaaaacat	aatctttact	aactcctcag	gaggggaccc	1380
agaaattaca	acacttagtt	ttaattgtgc	aggagaattt	ttctattgca	atacaacagg	1440

SEQ 89

f

```

cctgtttaat ggtacgtggt ggaacaatgg tacgtggaac gggccctaca cacctaataa 1500
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aagagcagtt ggactgggag ctgtcttcct tgggttcctg ggagcagcag gaagcactat 1860
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cttgagagat tgcattattg ttgcagcgag gactgtggaa cttctgggac actgcagtct 2640
caagggactg agactggggt gggaaggctc caagaatctg tggaatcttc tgttatactg 2700
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```

<210> 97

<211> 246

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=vpu

<400> 97

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atgttacctt tagtaatatt ggcaatagta ggactgatag tagctttaat cttagcaata 60
gttgtatgga ctatagtatt catagaatat aagaaaatta agaagcaaag gaaaatagac 120
tggttaatca aaagaataag tgagagagca gaagacagtg gcaatgagag tgatggggac 180
acagaggaac tatcagcact tgtggagagg gggcatcttg attttgggga tgttaataat 240
gtgtaa

```

<210> 98

<211> 2598

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=env

<400> 98

```

atgagagtga tggggacaca gaggaactat cagcacttgt ggagaggggg catcttgatt 60
ttggggatgt taataatgtg taaagctaca gatttgtggg tcacagtata ctatggagta 120
cctgtgtgga aagatgcaga taccatccta ttttgtgcat cagatgctaa agcatatgat 180
acagaagtgc ataatgtatg ggccacacat gcctgtgtac ccacagaccc caaccacaa 240
gaaataaacc tggaaaatgt aacagaaaat tttaatatgt ggaaaaataa catggtagag 300
cagatgcaag aagatataat cagcttatgg gatcaaagcc taaagccatg tgtaaaatta 360
accccgctct gcgtcatttt aaattgtagc aatgccaaata ccagcaccca tagcaatagc 420

```

SEQ 90

f

agtagcacc	agagcccat	taatgaagaa	ataaaaaact	gctcttaca	tactaccaca	480
atactaagag	ataagacaca	aaaagtttat	tcactgtttt	atagacttga	tgtagtaca	540
cttgatgaaa	gtgaaaataa	gaatacatca	ggtagtaata	ctctgtatag	actaataaat	600
tgtaatacct	caaccatcac	acaagcgtgt	ccaaaggtaa	cctttgagcc	aattcctata	660
cattattgtg	ccccagctgg	ttttgcgatt	ctaaagtgt	aggatccgag	attcaatgga	720
acagggctcat	gcaagaatgt	tagctcagta	caatgtacac	atggaattaa	accagtagca	780
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gaaaatatta	caaacaatgc	caaaaacata	atagttcagt	ttactaagcc	tgtactaatt	900
acttgtatca	gacccaacaa	caatacaaga	aaaagtatac	gctttggacc	aggacaagcc	960
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aatggtacgt	ggaacgggcc	ctacacacct	aataacacca	atggaagtat	aatcctccca	1260
tgcagaataa	aacaaattat	aaacatgtgg	cagagagtag	gaagagcaat	gtatgcccct	1320
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ggtggtaaca	atgggactaa	tgagaccttc	agacctggag	gaggagatat	gagggacaat	1440
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atagggcaaa	gagctttcag	agctattctc	aacataccta	gaagaatcag	acagggctta	2580
gaaagggctt	tactataa					2598

<210> 99

<211> 654

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=nef

<400> 99

atggggggca	agtgggtcaa	aaggagcata	ccaggatggc	ctgctattag	ggagagaatg	60
agaagaactc	ctccaacagc	acaaagaaca	gaagcagtg	ctccagcagc	accaggagta	120
ggagcagtg	ctcaagattt	agctactcat	ggagcagtc	caagcagtaa	tacagcagct	180
actaatcctg	attgcgcctg	ggtggaagcg	caagaagagg	agagtgaagt	aggcttccca	240
gtcaggccac	aggtaacctt	aaggccaatg	accttcaagg	gagcgtttga	tctcagcttc	300
tttttaaaag	aaaagggggg	actggatggg	ttaatttact	cccagaaaag	acaagacatc	360
cttgatatgt	gggtctacca	cacacaaggc	tacttcctg	attggcagaa	ttacacacca	420

SEQ 91

f

```

gggccaggga tcagataccc attaacattt ggatggtgct tcaagctagt accagtagag 480
ccatctgagg tagaagaagc tactcaggga gagaacaaca gcttattaca ccctatatgc 540
caacatggag tagatgaccc tgaaagagaa gtgttaagat gggagtttga tagaagcctg 600
gcacggagac acagagcccc agagctgcat ccggagtact acaaagactg ctga 654

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<210> 100

<211> 1476

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=gag

<400> 100

```

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ttaaggccag ggggaaagaa acattatatg ataaaacact tagtatgggc aagcagggag 120
ctggaaagat ttgcgcttaa ccctggcctt ttagagacgt cagacggatg taaacaaata 180
ataaaacagc tacatccagc tcttaagaca ggaacagagg aacttaggtc attattcaac 240
acagtagcaa ctctctattg tgtacatgca gggatagagg tacgagacac caaggaagcc 300
ttagacaaga tagaggaaga acaaaacaaa agtcagcaaa aaatacagca ggcaaaagag 360
gctgacggaa aggtcagtc aattatcct atagtgc aaa atctccaagg gcaaatggta 420
caccagcccc tatcacctag aactttgaat gcgtgggtaa aagtaataga ggagaaggct 480
tttagcccag aggtaatacc catgttcaca gcattatcag aaggagccac cccctctgat 540
ttaaacacca tgttaaatac agtgggggga catcaagcag ccatgcaaat gttaaaagat 600
accatcaacg aggaggctgc ggaatgggat agattacatc cagtacatgc agggcctaata 660
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tgtactgaga ggcaggctaa ttttttaggg aaaatttggc cttcccacaa ggggaggcca 1320
gggaatttcc ttcaaaacag gccagagcca acagccccac cagcagagag cttcagggttc 1380
aaggagacaa cccccgctcc gaagcaggag tcgaaagaca gggaaccctt aacttccttc 1440
aatcactct ttggcagcga ccccttgtct caataa 1476

```

<210> 101

<211> 3011

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=pol

<400> 101

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ttttttaggg aaaatttggc cttcccacaa ggggaggcca gggaatttcc ttcaaaacag 60
gccagagcca acagccccac cagcagagag cttcagggttc aaggagacaa cccccgctcc 120
gaagcaggag tcgaaagaca gggaaccctt aacttccttc aaatcactct ttggcagcga 180
ccccttgtct caataaaagt agggggccag ataaaggaag ctctcttaga cacaggagca 240
gatgatacag tattagaaga aatagctttg ccaggaagat ggaaaccaa aatgatagga 300

```

SEQ 92

f

```

ggaattggag gttttatcaa agtaagacag tatgatcaaa tacttataga aatttgtgga 360
aaaaaggcta taggtacagt attagtagga cctacacctg tcaacataat tggaagagat 420
atgttgactc agcttggatg cactctaaat tttccaatta gccccattga aactgtacca 480
gtaaaaattaa agccaggaat ggatggccca aagggttaaac agtggccatt gacagaagag 540
aaaaataaaag cattaacaga aatttgtaaa gaaatggaga aggaaggaaa aattacaaaa 600
attgggcctg aaaatccata taacactcca gtatttgcca taaaaaggaa ggacagtact 660
aagtggagaa aattagtaga tttcagggag ctcaataaaa gaactcaaga cttttgggaa 720
gttcaattag gaataccaca cccagcaggt ttaaaaaaga aaaaatcagt gacagtactg 780
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taatacaaga taatagtgac ataaaggtag tgccaaggag gaaagcaaaa attattaggg 2940
attatggaaa acagatggca ggtgctgatt gtgtggcagg tagacaggat gaggatcaga 3000
acatggaata g 3011

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<210> 102

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=vif

SEQ 93

f

```

<400> 102
atggaaaaca gatggcaggt gctgattgtg tggcaggtag acaggatgag gatcagaaca 60
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agacatcatt atgaaagcag acatccaaaa gtaagtgcag aagtacacat cccattagga 180
gatgctagat tagtaataaa aacataattg ggtttacaaa caggagaaag agattggcat 240
ttgggtcatg gcgtctccat agaattggaga ttgggaagat atagcacaca agtagaacct 300
ggcctggcag accagctaata ccatatgcat tattttgatt gttttgcaga ctctgccata 360
agaaaagcca tattaggaca catagtattt tctaggtgtg attatcaagc aggacataat 420
aaggtaggat ctctacaata cttggcactg acagcattga taaaaccaa aaagagaaaag 480
ccacctctgc ctagtgtaa gaaattagta gaggatagat ggaacaatcc ccagaagacc 540
agggaccaca gagggaacca tacaatgaat ggacactag 579

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```

<210> 103
<211> 291
<212> DNA
<213> Human immunodeficiency virus type 1

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```

<220>
<223> isolate=94IN476.104; gene=vpr

```

```

<400> 103
atggaacaat cccagaaga ccagggacca cagaggggaac catacaatga atggacacta 60
gagcttctag aggaactcaa gcaggaagct gtcagacact ttcctagacc ttagcttcat 120
agcttaggac aatataatcta tgaaacatat ggggatgctt ggacaggagt cgaagcttta 180
ataagaacac tgcaacaatt actgtttatt catttcagaa ttgggtgcca gcatagcaga 240
ataggcattt tacaacggag aagagcaaga aatggagcca gtagatccta a 291

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```

<210> 104
<211> 2633
<212> DNA
<213> Human immunodeficiency virus type 1

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<220>
<223> isolate=94IN476.104; gene=tat

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```

<400> 104
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agcagtgagg atcatcaaaa tcttatatca aagcagtaag tatatgtaat ggtgaattta 240
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aacaggtaa ttgaaagaat tagggaaaga gtagaagaca gtggcaatga gagtgagggg 420
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agaagcaaaa actactttat tctgtgcatc agatgctaaa gcttatgaga aggaggtgca 600
taatatctgg gctacacatg cctgtgtacc cacagacccc aaccacaag agatggattt 660
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aaaaaattgc tcttttaatg caaccacaga aataagagac aagaaacgca aagagtatgc 900
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SEQ 94

f

ctcttttgac	ccaattccta	tacattattg	tgctccagct	ggttttgcca	ttctaaagt	1080
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acatggaatt	aagccagtgg	tatcaactca	actactgtta	aatggtagca	cagcagaaaa	1200
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taatgaatcc	ataaaaaattg	tatgtacaag	acccaacaat	aacacaagaa	aaagtataag	1320
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aattgtataca	catagcttta	attgtggagg	agaattcttt	tattgtataa	catcaagact	1560
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cgcggcgtca	atgacgctga	cggtacaggc	cagacaattg	ttgtctggta	tagtgcaaca	2040
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cttgataggt	ttgagaataa	tttttgctgt	gctatctata	gtaaatagag	ttaggcaggg	2520
atactcacct	ttgtcgttgc	agacccttac	cccagaccgc	agggaaccgc	acaggctcag	2580
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<210> 105

<211> 2651

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=rev

<400> 105

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atcttatatc	aaagcagtaa	gtatatgtaa	tggtgaattt	attagaaaga	gtagattata	120
gattaggagt	aggagcatta	atagtagcat	taatcttagc	aataattgtg	tggaaccatag	180
catatctaga	atataggaaa	ttgttaagac	aaagaaaaat	aaacagggtta	attgaaagaa	240
ttagggaag	agtagaagac	agtggcaatg	agagttaggg	ggatactgag	gaattgtcaa	300
cactggtgga	tatggggaat	cttaggcttt	tggtatgctaa	tgattttataa	tgtagtaggg	360
aacttgtggg	tcacagtcta	ttatggggta	cctgtgtgga	aagaagcaaa	aactacttta	420
ttctgtgcat	cagatgctaa	agcttatgag	aaggagggtgc	ataatatctg	ggctacacat	480
gcctgtgtac	ccacagacc	caaccacaa	gagatggatt	tagtaaatgt	aacagaaaaat	540
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gatcaaagcc	taaagccatg	tgtaaaagttg	acccactct	gtgtcacttt	aaactgtagt	660
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SEQ 95

f

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gtatgtacaa gacccaacaa taacacaaga aaaagtataa ggatagggcc aggacaagca 1200
ttctatgcaa caaacggcat aataggagac ataagacaag cacattgtaa cattagttaa 1260
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gcagcgagag cggtggaact tctgggacgc agcagtctca ggggactaca gagggggtgg 2640
gaagccctta a 2651

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<210> 106  
 <211> 261  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=94IN476.104; gene=vpu

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<400> 106
atggtgaatt tattagaaag agtagattat agattaggag taggagcatt aatagtagca 60
ttaatcttag caataattgt gtggaccata gcatacttag aatataggaa attgttaaga 120
caaagaaaaa taaacaggtt aattgaaaga attagggaaa gagtagaaga cagtggcaat 180
gagagtgagg gggatactga ggaattgtca acactggtgg atatggggaa tcttaggctt 240
ttggatgcta atgatttata a 261

```

<210> 107  
 <211> 2574  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=94IN476.104; gene=env

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<400> 107
atgagagtga gggggatact gaggaattgt caacactggt ggatatgggg aatcttaggc 60

```

SEQ 96

f

ttttggatgc	taatgattta	taatgtagta	gggaacttgt	gggtcacagt	ctattatggg	120
gtacctgtgt	ggaaagaagc	aaaaactact	ttattctgtg	catcagatgc	taaagcttat	180
gagaaggagg	tgcataatat	ctgggctaca	catgcctgtg	taccacaga	ccccaaccca	240
caagagatgg	atttagtaaa	tgtaacagaa	aattttaaca	tgtggaaaaa	tgacatgggtg	300
gatcagatgc	atgaggatgt	aatcagttta	tgggatcaaa	gcctaaagcc	atgtgtaaag	360
ttgacccac	tctgtgtcac	tttaactgt	agtaagggtta	ccaataatgc	tacttacaat	420
aatactgatg	atataaaaaa	ttgctctttt	aatgcaacca	cagaaataag	agacaagaaa	480
cgcaaagagt	atgcactggt	ttatagactc	gatatagtac	cactaaatga	gaataagaac	540
agctctagta	actatagtga	gtacatatta	ataaattgta	atacctcaac	cataacacaa	600
gcctgtccaa	aggtctcttt	tgacccaatt	cctatacatt	attgtgctcc	agctgggtttt	660
gcgattctaa	agtgtaaaga	tgagacattc	aatgggacag	gaccatgcaa	ggaggtcagt	720
acagtacaat	gtacacatgg	aattaagcca	gtggtatcaa	ctcaactact	gttaaattggt	780
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gacataagac	aagcacattg	taacattagt	gaatctaact	ggactaaaac	tttacaagag	1020
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acaaattcca	gttcagacat	catcatgctt	ccatgcagaa	taaggcaatt	tataaacatt	1260
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gaagaatcgc	aaatccagca	ggaacaaaat	ggaaaagatt	tattagcatt	ggacagttgg	1980
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ataacaatag	ctgaggggaac	agataggatt	atagaattta	cacaaagaat	ttgcagagct	2520
atccgcaaca	tacctagaag	aataagacag	ggttttgaag	cagctttgct	ataa	2574

<210> 108

<211> 624

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=nef

<400> 108

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SEQ 97

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ggagcactta caaccagcaa cacaccaagc aataatgctg ctggtgcctg gctgcaagcg 180
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acttataaag gagcattcga tctcgcttc tttttaaaag aaaagggggg actggatggg 300
ttaatttact ctaagaaaag gcatgaaatc cttgatttat gggtttataa cacacaaggc 360
tacttcctg attggcaaaa ctacacacca ggaccagggg tcagatatcc actgaccttt 420
ggatgggtgct acaagctagt accagttgac ccaagtgtag tagaagaggc caacaaagga 480
gaaaacaact gtttgctaca ccctatgagc caacatggaa tggatgatga agatggagaa 540
gtattaaagt ggcagtttga cagcagccta gcacgcagac acatagcccg cgagctacat 600
ccggagtatt acaaagactg ctga 624

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<210> 109

<211> 17

<212> DNA

<213> artificial sequence

<220>

<223> Upstream primer UP1A spanning tRNA primer binding state

<400> 109

agtggcgccc gaacagg

17

<210> 110

<211> 22

<212> DNA

<213> artificial sequence

<220>

<223> Downstream primer Low2 spanning the R/U5 junction in the  
3' long terminal repeat

<400> 110

tgaggcttaa gcagtgggtt tc

22

<210> 111

<211> 28

<212> DNA

<213> artificial sequence

<220>

<223> Upstream UP1AMlul primer containing Mlul restriction site

<400> 111

tctctacgcg tggcgcccga acagggac

28

<210> 112

<211> 35

<212> DNA

<213> artificial sequence

<220>

<223> Downstream Low1Mlul primer containing Mlul restriction site

<400> 112

accagacgcg tacaacagac gggcacacac tactt

35

SEQ '98